**IN THE UNITED STATES DISTRICT COURT**
**FOR THE MIDDLE DISTRICT OF PENNSYLVANIA**

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| UNITED STATES OF AMERICA,<br><br>v.<br><br>NATHAN CROWDER, *et al.*,<br><br>Defendants. | No. 4:17-CR-00291<br><br>(Judge Brann) |

# MEMORANDUM OPINION

**FEBRUARY 19, 2020**

## I. BACKGROUND

In 2017, Nathan Crowder was indicted with two charges related to a conspiracy to distribute a controlled substance.[1] The indictment has been superseded three times,[2] with the most recent superseding indictment having been filed in July 2019. The third superseding indictment charges Crowder, Markeese Askew, Wayne Davidson, and Raymond Howard (collectively "Defendants") with numerous counts related to the conspiracy to distribute a controlled substance.[3]

As most relevant here, the third superseding indictment charges three of the Defendants—Crowder, Davidson, and Askew—with distribution of a controlled substance causing serious bodily injury, in violation of 21 U.S.C. §§ 841(a)(1),

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1 Doc. 1.

2 Docs. 22, 46, 206.

3 *See* Doc. 206.

(b)(1)(C).[4] Crowder is charged in Count 3 with causing serious bodily injury to JJ, in Count 7 with causing serious bodily injury to JS, in Count 12 with causing serious bodily injury to BB, and in Count 13 with causing serious bodily injury to AM.[5] Davidson is charged with causing serious bodily injury to BK in Count 4, SP in Count 6, and RS and CS in Count 8, while Askew is charged in Count 10 with causing serious bodily injury to RS.[6]

In August 2019, the Government filed a notice of expert testimony from Lewis Nelson, M.D.[7] In his expert report, Dr. Nelson reviewed thirteen suspected opioid overdoses—eleven non-fatal overdoses that were charged in the third superseding indictment, along with two fatal overdoses[8] that were not charged in the indictment.[9] All suspected overdoses occurred in the Williamsport, Pennsylvania area between June 27, 2017, and June 29, 2017.[10] In preparing his report, Dr. Nelson reviewed police reports, laboratory testing reports, emergency medical service and other medical records, coroner reports, and grand jury testimony transcripts.[11]

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4 *Id.*

5 *Id.*

6 *Id.*

7 Doc. 214.

8 The overdose victims in those instances were Delaney Farrell and Richard Harris.

9 *See* Doc. 234-1.

10 *Id.* at 1.

11 *Id.*

Dr. Nelson summarized the cases thusly:

> Several presumed opioid overdose deaths occurred during the period of June 27-29, 2017 in the Williamsport, PA area. Recovered items at the scene of each were drug packets that tested positive for heroin and carfentanil at a reference laboratory facility. There are many similarities between the cases, including the use of a smaller than usual amount leading to exaggerated clinical effects and the understanding of some of the users that the drug they obtained was "stronger" than usual. Some of the overdose victims received naloxone, primarily for mental status and/or respiratory depression and responded with awakening. There was variation among the cases in the toxicology testing performed in the hospital and by the coroner's office.[12]

After reviewing the circumstances surrounding the thirteen suspected overdoses,[13] Dr. Nelson opined that "[m]arkers for a high risk of harm, including death, after an opioid overdose include the need for mechanical/manual ventilation, additional oxygen, or naloxone. All of the subjects in this report, with the exception of [the victim noted in Count 7, JS,] appeared by review of the records provided to be sufficiently opioid intoxicated to have had a fatal outcome had ventilatory support or naloxone not been provided."[14] Dr. Nelson further opined that both fatal overdose cases resulted from the ingestion of carfentanil.[15]

On November 4, 2019, Crowder and Askew filed motions to exclude the Government's expert medical testimony; Crowder's motion was joined by Davidson

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[12] *Id.*

[13] *Id.* at 2-4.

[14] *Id.* at 4.

[15] *Id.* at 5.

and Howard.[16] Crowder's motion to exclude rests on two primary grounds. First, he asserts that any testimony related to the overdose deaths of Delaney Farrell and Richard Harris should be excluded because it is irrelevant, as the deaths are not linked to any defendant and because such testimony is unduly prejudicial.[17] Second, Crowder asserts that any testimony related to the overdoses that did not result in death should be excluded because Dr. Nelson's report is unreliable.[18] Specifically, Crowder contends that Dr. Nelson failed to explain how the victims' use of heroin/carfentanil was the but-for cause of their serious bodily injury, and failed to disclose the methodology for his conclusions.

Askew seeks the exclusion of Dr. Nelson's testimony as it relates to Count 10 of the third superseding indictment.[19] First, he contends that Dr. Nelson's opinion is unreliable because it is based upon insufficient facts and data, as Dr. Nelson relies on documents that do not contain a toxicology report or any other evidence as to what was in RS's system.[20] Thus, according to Askew, there is no evidence that heroin or carfentanil caused RS's overdose, particularly in light of RS's testimony that he was a drug addict who could not remember what occurred immediately prior

[16] Docs. 233, 234, 235, 236, 238, 245.

[17] Doc. 234 at 5-7.

[18] *Id.* at 7-12.

[19] Doc. 236-2.

[20] *Id.* at 7-8.

to his overdose.[21] Second, Askew asserts that Dr. Nelson's opinion is not based on reliable principles and methods because, absent a toxicology report, Dr. Nelson cannot reliably determine the but-for cause of RS's overdose.[22]

Finally, Askew argues that Dr. Nelson's opinion is not based on the reliable application of principles and methods to the facts of this case. Askew contends that, although Dr. Nelson states that the overdose was caused by carfentanil, he also acknowledges that there is no currently-identified lethal blood concentration for that drug and, in any event, no blood or urine tests were performed and Dr. Nelson does not know the relative concentration of carfentanil in the heroin/carfentanil mixture that was found with RS at the time of his overdose.[23] Furthermore, Askew asserts that Dr. Nelson failed to account for the possibility that RS had other drugs in his system that may have caused the overdose.[24]

In December 2019, this Court conducted a hearing on Defendants' motion and received testimony from Dr. Nelson.[25] In light of Dr. Nelson's testimony at the hearing, the Court afforded all parties the opportunity to file supplemental briefs in

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[21] *Id.* at 8-10.

[22] *Id.* at 10-11.

[23] *Id.* at 11-12.

[24] *Id.* at 12-13.

[25] *See* Docs. 252, 259.

this matter.[26] The parties have filed their briefs,[27] and the matter is now ripe for disposition. For the following reasons, the motions will be denied.

## II. DISCUSSION

Federal Rules of Evidence 702 and 703 govern the admissibility of expert testimony and set forth certain criteria for admissibility. Expanding upon those Rules, the United States Supreme Court set out the standard for admissibility of expert testimony in *Daubert v. Merrell Dow Pharm., Inc.*[28] The Court in *Daubert* delegated to district courts a "gatekeeping responsibility" under Rule 702, which requires that courts determine at the outset whether an expert witness may "testify to (1) scientific knowledge that (2) will assist the trier of fact."[29] That gate-keeping function demands an assessment of "whether the reasoning or methodology underlying the testimony is scientifically valid" as well as "whether that reasoning or methodology properly can be applied to the facts in issue."[30] A district court "exercises more control over experts than over lay witnesses," since "[e]xpert evidence can be both powerful and quite misleading because of the difficulty in evaluating it."[31]

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[26] Doc. 260.

[27] Docs. 264, 265, 266, 267, 268.

[28] 509 U.S. 579 (1993).

[29] *Id.* at 592.

[30] *Id.* at 592-93.

[31] *Id.* at 595 (internal quotation marks omitted).

Following *Daubert*, the United States Court of Appeals for the Third Circuit cast expert admissibility determinations in light of three basic requirements: (1) qualification; (2) reliability; and (3) fit.[32] The qualification prong demands that the proffered expert possess sufficient "specialized knowledge" to testify as an expert.[33] To satisfy the reliability prong, an expert's opinion "must be based on the 'methods and procedures of science' rather than on 'subjective belief or unsupported speculation.'"[34] The Third Circuit has set forth eight non-exclusive factors that "a district court should take into account" when deciding the reliability of expert testimony:

> (1) whether a method consists of a testable hypothesis; (2) whether the method has been subject to peer review; (3) the known or potential rate of error; (4) the existence and maintenance of standards controlling the technique's operation; (5) whether the method is generally accepted; (6) the relationship of the technique to methods which have been established to be reliable; (7) the qualifications of the expert witness testifying based on the methodology; and (8) the non-judicial uses to which the method has been put.[35]

With regard to the fit prong, the Third Circuit explained that admissibility "depends . . . on the proffered connection between the scientific research or test result . . . and [the] particular disputed factual issues."[36]

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[32] *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 741-43 (3d Cir. 1994) ("*Paoli II*").

[33] *Id.* at 741.

[34] *Id.* at 742 (*quoting Daubert*, 509 U.S. at 589).

[35] *Id.* at 742 n.8.

[36] *Id*. at 743 (internal quotation marks omitted).

The burden of proof for admissibility of expert testimony falls upon the party that seeks to introduce the evidence.[37] However, as the Third Circuit has emphasized, "[t]he test of admissibility is not whether a particular scientific opinion has the best foundation or whether it is demonstrably correct. Rather, the test is whether the particular opinion is based on valid reasoning and reliable methodology."[38]

> This standard is not intended to be a high one, nor is it to be applied in a manner that requires the plaintiffs to prove their case twice—they do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have to demonstrate by a preponderance of evidence that their opinions are reliable.[39]

District courts must always be cognizant of the fact that "[t]he analysis of the conclusions themselves is for the trier of fact when the expert is subjected to cross-examination."[40]

### A. Qualification

As to the first prong of the *Daubert* analysis, Defendants wisely eschew any challenge to Dr. Nelson's credentials or qualification to offer testimony about opioids, their effects, and the risks associated with an opioid overdose.[41] Indeed, as

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[37] *Oddi v. Ford Motor Co.*, 234 F.3d 136, 145 (3d Cir. 2000)

[38] *Id.* (internal quotation marks omitted).

[39] *Id.* (internal quotation marks omitted).

[40] *Id.* (internal quotation marks omitted).

[41] *See* Docs. 234, 236, 264, 265.

counsel for Askew concedes, "Dr. Nelson is an accomplished emergency physician and toxicologist . . . [with] what appear to be . . . abundant qualifications."[42] The Court agrees.

Dr. Nelson's curriculum vitae reflects a wealth of education and experience in the field of toxicology, emergency medicine, and opioid intoxication.[43] Dr. Nelson obtained his medical degree in 1989, completed his residency in emergency medicine, and was a medical toxicology fellow at the New York City Poison Center. He is board certified in medical toxicology, addiction medicine, and emergency medicine, and had authored or co-authored hundreds of peer-reviewed medical articles, as well as dozens of textbooks or textbook chapters—including several that relate directly to opioids. In short, the Court finds it beyond peradventure that Dr. Nelson possesses sufficient "specialized knowledge" to testify as an expert in the fields of emergency medicine, opioids, and opioid overdoses.[44]

**B. Reliability**

Defendants argue that Dr. Nelson's opinion is not reliable for several reasons. First, they contend that, although differential diagnosis is an acceptable method and procedure of medicine, Dr. Nelson did not adequately apply that technique in this

[42] Doc. 265 at 2.

[43] *See* Gov. *Daubert* Ex. 4.

[44] *Paoli II*, 35 F.3d at 741.

matter.[45] Second, Defendants assert that Dr. Nelson's testimony does not have a valid scientific connection to the relevant inquiry, i.e., it does not explain whether a heroin/carfentanil mixture was the but-for cause of the victims' overdoses and alleged concomitant serious bodily injury.[46] Finally, Askew argues that the absence of toxicology reports, as well as Dr. Nelson's testimony regarding drug "hot spots," renders his opinion unreliable.[47]

1. *Differential Diagnosis*

As to Dr. Nelson's differential diagnosis, he explained that opioid overdoses are generally identified using differential diagnosis, a technique that is peer-reviewed, supported by decades of research, and is the "basis of medical training."[48] To conduct a differential diagnosis, doctors first examine "the [patient's] history, particularly the recent history of what's been going on; where was the person found, what were they doing, was there paraphernalia, were other people around, do they have a substance abuse history."[49] Once that is complete, doctors will "then do a physical exam and we look for . . . things . . . such as their vital signs or what's their heart rate, what's their respiratory rate and what's their respiratory depth."[50]

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45 Doc. 236-2 at 12-13; Doc. 264 at 5-7; Doc. 265 at 6-7.

46 Doc. 234 at 8-9; Doc. 236-2 at 8-10; Doc. 264 at 4-5; Doc. 265 at 7-8.

47 Doc. 264 at 4-5; Doc. 236-2 at 5-6, 10-12.

48 Doc. 259 at 65; *see id.* at 21-22.

49 *Id.* at 19.

50 *Id.*

"Once [doctors] come up with the best likelihood in our differential diagnosis, so to speak, we list out and we prioritize diagnoses."[51] Doctors then "go down that list and try to exclude or rule in those various diagnoses."[52] At that point, if a doctor believes that an individual is suffering from an opioid overdose, they will typically administer naloxone, a drug that reverses the effects of an opioid overdose.[53] As Dr. Nelson testified, "the only thing that really would reverse with naloxone the way that we're talking about would be an opioid. And essentially a response to naloxone is diagnostic of opioid intoxication."[54] Medical professionals rarely use toxicology tests to diagnose opioid overdoses because "[e]ven in the best hands, it's going to take 15 or 20 minutes to come back. And in most places, it's more like a two or three hour turnaround time. So none of us are really going to be able to wait to make a decision to treat for that duration of time."[55]

Although the parties agree that differential diagnosis is a valid medical tool, Crowder argues that Dr. Nelson's differential diagnosis was flawed because he did not take all of the steps outlined by the Third Circuit for conducting such a process, including that Dr. Nelson did not: (1) physically examine the victims; (2) review their full medical histories; or (3) rely on proper information to rule in carfentanil as

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[51] *Id.* at 20.

[52] *Id.* at 33.

[53] *Id.* at 20-21.

[54] *Id.* at 21.

[55] *Id.* at 23.

the cause of the overdoses.[56] Defendants further argue that Dr. Nelson's differential diagnosis is unreliable because he did not adequately exclude all other possible causes for the victims' overdoses.[57]

With regard to Defendants' argument that Dr. Nelson did not undertake all steps that are performed in an "ideal" differential diagnosis or exclude all other possible causes for the overdoses, he was not required to so do. It is true that the Third Circuit has stated "that performance of physical examinations, taking of medical histories, and employment of reliable laboratory tests all provide significant evidence of a reliable differential diagnosis, and . . . their absence makes it much less likely that a differential diagnosis is reliable."[58] Moreover, "experts [should] at least consider alternative causes."[59] Nevertheless, while those steps are common practice, the Third Circuit emphasized that "the steps a doctor has to take to make that (differential) diagnosis reliable are likely to vary from case to case; the information a doctor needs in order to reliably assess the cause of a patient's lung cancer is often very [different] from the information needed to assess the cause of a patient's back or heart trouble."[60]

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[56] Doc. 264 at 5-7.

[57] Doc. 264 at 7; Doc. 265 at 6-7.

[58] *Paoli II*, 35 F.3d at 758.

[59] *Id.* at 759.

[60] *Id.* at 758.

Thus, doctors do "not have to conduct every possible test to assess whether his or her view was correct so long as he or she employed sufficient diagnostic techniques to have good grounds for his or her conclusion."[61] In that vein, "there will be some cases in which a physician can offer a reliable differential diagnosis without examining the patient, looking at medical records, taking a medical history, and performing laboratory tests."[62] Accordingly, a differential diagnosis is generally reliable even where the doctor "engaged in very few standard diagnostic techniques by which doctors normally rule out alternative causes [unless] the doctor offered no good explanation as to why his or her conclusion remained reliable."[63] A differential diagnosis may also be unreliable if "the defendants pointed to some likely cause of the [overdose] . . . and [the doctor] offered no reasonable explanation as to why he or she still believed that the defendants' actions were a substantial factor in bringing about that [overdose]."[64]

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61 *Id.* at 761.

62 *Id.* at 762. The Third Circuit concluded that "sometimes differential diagnosis can be reliable with less than full information." *Id.* at 759. By way of example, the Third Circuit stated "imagine a patient who comes in with medical records that include x-rays showing a fractured arm and who tells the doctor that he hurt the arm in a biking accident; the doctor could reliably conclude that the patient had a fractured arm caused by a biking accident even without physically examining the patient or taking a medical history. The biking accident is so much more likely to have been the cause of the fracture than anything else that there is no need to examine alternatives." *Id.* at 759-60. ‼

63 *Id.* at 760.

64 *Id.*

Here, Dr. Nelson provided a reasonable explanation for his failure to undertake certain steps in the differential diagnosis process. Dr. Nelson reviewed "police reports, laboratory testing reports, EMS and medical records, coroner report, and testimony transcripts" in reaching his opinion.[65] This was more information than Dr. Nelson would typically have available to him when making a life-saving diagnosis in the emergency room.[66] Dr. Nelson was able to quickly rule out all causes for the overdoses other than an opioid because eight of the nine living overdose victims responded to naloxone,[67] and "the only thing that would reverse with naloxone . . . would be an opioid [overdose]."[68] From there, Dr. Nelson only needed to determine the type of opioid used.

Dr. Nelson concluded within a reasonable degree of medical certainty that the living overdose victims identified in the indictment overdosed on a heroin/carfentanil mixture.[69] That conclusion is based primarily on two factors. First, Dr. Nelson noted that all but one of the overdose victims had unused packets of narcotics on their persons, and those packets tested positive for a heroin/carfentanil mixture.[70] This strongly suggests that the individuals overdosed

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65 Doc. 234-1 at 1.

66 Doc. 259 at 45.

67 Doc. 234-1 at 2-4.

68 Doc. 259 at 21.

69 Doc. 234-1 at 5.

70 *See* Doc. 234-1.

on the same mixture. As Dr. Nelson testified, "what happens in real life . . . [is that] people use the drug. They lose consciousness and the drug packet remains with them. So I don't see any other [viable] conclusion" other than that the individuals overdosed on the same heroin/carfentanil mixture that was discovered on or near their persons.[71] Although Dr. Nelson agreed that such information does not *definitively* prove that the individuals overdosed on that heroin/carfentanil mixture, he emphasized:

> I think that you are talking about absolute knowledge and we're talking about clinically relevant information here. And it is my opinion, medically speaking, and I feel pretty confident, that if somebody comes in this situation with this packet of drugs and they have got an opioid overdose that that's what they took. So from—you know, if you want to talk about reasonable degree of medical certainty, which is what I'm quoting, I'm expected to maintain not absolute . . . perfection . . . but a reasonable degree of certainty, I think that this is what they were exposed to and that they were at a high risk of death because they were exposed to this. So that's what my conclusion states.[72]

The Court agrees that this is a commonsense approach to the facts of this case. The testimony and other evidence establish that most of the users had packets of a heroin/carfentanil mixture on or near their persons at the time of their overdoses.[73] The Williamsport, Pennsylvania area was at that time experiencing a high number

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[71] Doc. 259 at 85. *See also id.* at 81 ("But if you—here's a packet of drug that's found with the patient, I would make the probably very reasonable conclusion that that was the opioid that they used"); *id.* at 120 ("So it is—the proximate cause of his current event is the last drug that he used, which again, in my medical opinion, would be the drug that he was holding in his pockets at the time").

[72] *Id.* at 119.

[73] Doc. 234-1.

of opioid overdoses as a result of a heroin/carfentanil mixture that was being sold in the region.[74] Two individuals died of opioid overdoses during that time, and chemical blood tests performed on the decedents confirmed the presence of carfentanil in their system.[75] It would be an extraordinary coincidence if all of the living overdose victims had the same packets of heroin/carfentanil mixture in their possession—the same substance that was causing a spike of opioid overdoses in the region—and yet those individuals somehow overdosed on a different substance than the one found on their person. The most reasonable explanation—one that is supported by Dr. Nelson's decades of experience in emergency medicine and toxicology—is that the overdose victims quickly "lo[st] consciousness and the drug packet remain[ed] with them" and, thus, the packets that were tested were composed of the same substance that caused the individuals to overdose.[76]

Second, in at least one overdose that Dr. Nelson discussed, there is additional evidence that the heroin/carfentanil mixture found on the overdose victim was the same substance that he ingested. RS—the victim identified in Count 10 of the indictment—was found with nine unused bags of heroin/carfentanil mixture near his person, and one empty, used bag.[77] Dr. Nelson asserted that "they found nine packets

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[74] *Id.* at 1.

[75] *Id.* at 2, 5.

[76] Doc. 259 at 85.

[77] *Id.* at 42.

in his pocket. And heroin is usually bought as a bundle of ten. So again, it's a presumption the packet that was used was the tenth packet in the bundle."[78] This supports the conclusion that RS overdosed on the same substance that was contained in the nine unused bags of heroin/carfentanil mixture.

Further, RS stated that he used a smaller amount of heroin than usual when he overdosed.[79] RS testified before the grand jury that "at that point in my addiction [one bag of heroin] was nothing."[80] Similarly, SP overdosed on the presumed heroin/carfentanil mixture, was revived with naloxone, then later "'used less than' he used earlier and overdosed again."[81] All of this is "very consistent" with those individuals using "carfentanil and its higher potency."[82] Dr. Nelson explained:

> we know that . . . there is an ultra-potent opioid in the supply. It's been stated that the opioid that was being used was strong. The person used less than they normally would use and appeared to—or at least they said they used less than they normally used and overdosed. So everything comes together nicely to suggest that there was an ultra-potent opioid

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[78] *Id.* at 43-44. *See* Doc. 236-1 at 18 (police report noting that RS purchased "a bundle or ten bags of heroin" and then used, and overdosed on, that heroin); *id.* at 27-30 (same); *United States v. Bailey*, 840 F.3d 99, 106 (3d Cir. 2016) (noting that heroin may be distributed "in 'bundles' (ten wax envelopes of heroin)"); *Dozier v. Henricks*, No. CIV A 01-4646, 2004 WL 5189659 at*1 n.4 (D.N.J. Nov. 5, 2004) ("Heroin is typically sold in small glassine envelopes. Ten envelopes stacked on top of each other and bound by a rubber band are referred to as a 'bundle'").

[79] Crowder takes issue with Dr. Nelson's reliance on the testimony and statements of the drug overdose victims and labels the testimony "self-serving." (Doc. 264 at 7). Crowder does not explain how the testimony was self-serving; to the contrary, the overdose victims provided testimony that was decidedly not self-serving, as they admitted to purchasing and using illegal narcotics.

[80] Doc. 236-1 at 30.

[81] Doc. 234-1 at 3.

[82] Doc. 259 at 44.

> in the . . . heroin supply. So I don't think we need any further testing to make that conclusion.[83]

Collectively, this information supports Dr. Nelson's determination that the individuals overdosed on a heroin/carfentanil mixture. Moreover, Dr. Nelson explained that he did not need to review the victims' medical histories because, in these cases, such histories would not be "helpful"[84] or "relevant at all."[85] In that respect, their medical histories and use of other drugs simply was not relevant "[b]ecause . . . carfentanil or heroin is essentially an 800-pound gorilla. Anything else that was involved in the person's pharmacotherapy, in their drug regimen, would be inconsequential compared to the monstrous dose of heroin or carfentanil that we[ are] talking about in these cases."[86]

That information reliably rules in carfentanil—and rules out other opioids—as the cause of the victims' overdoses. Although Dr. Nelson did not proceed through the full panoply of steps in a standard differential diagnosis, he provided a "reasonable explanation as to why he . . . still believe[s] that" carfentanil was "a substantial factor in bringing about [the victims' overdoses]."[87] That there is a

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83 *Id.* at 47.

84 *Id.*

85 *Id.* at 82.

86 *Id.* at 85; *see id.* at 84-86, 142-43. *See also id.* at 120 (Dr. Nelson noting that previous drug use is not relevant because "something he had used earlier in the day . . . has a fairly short half-life and wouldn't still be clinically active at this time").

87 *Paoli II*, 35 F.3d at 760.

remote possibility that some other unidentified opioid may have been the cause of the overdoses does not change this conclusion. Based on the information available, the Court concludes that a heroin/carfentanil mixture "is so much more likely to have been the cause of the [overdoses] than anything else that there is no need to examine alternatives."[88]

Finally, the presence of "hot spots" does not cast serious doubt upon Dr. Nelson's medical opinion. Dr. Nelson explained that "the mixing of the heroin and the carfentanil is often not uniform, and the drug winds up having sometimes what is called hot spots where you'll have a lot of carfentanil in a section and a lot of heroin in another, and there is not a lot of overlap."[89] True, the potential presence of hot spots does slightly diminish the relative likelihood that any one of the overdose victims took a heroin/carfentanil mixture, rather than a bag that by happenstance contained only heroin.

However, Dr. Nelson was aware of the possibility of hot spots and still concluded that the overdose victims likely used a heroin/carfentanil mixture. As discussed previously, the likelihood that any of the victims ingested pure heroin, rather than a heroin/carfentanil mixture, is small,[90] and it is not within the province

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[88] *Id.* at 759-60. Notably, however, Dr. Nelson did examine other causes of the victims' overdoses and was "able to rule out alternative causes." (Doc. 259 at 82). Based on all of the available data, Dr. Nelson ruled out other opioids within a reasonable degree of medical certainty. *Id.* at 151, 159-60.

[89] *Id.* at 155.

[90] *See* pp. 16-18.

of this Court to examine the relative merits or strength of Dr. Nelson's testimony or assertions; that is ultimately left to the jury. Rather, this Court must make a "preliminary assessment" of Dr. Nelson's testimony and is permitted to determine only whether such testimony is "helpful[] to the trier of fact."[91] As the United States Court of Appeals for the Eighth Circuit has explained:

> As a general rule, the factual basis of an expert opinion goes to the credibility of the testimony, not the admissibility, and it is up to the opposing party to examine the factual basis for the opinion in cross-examination. Only if the expert's opinion is so fundamentally unsupported that it can offer no assistance to the jury must such testimony be excluded.[92]

The presence of hot spots does not render Dr. Nelson's expert opinion "so fundamentally unsupported that it can offer no assistance to the jury."[93] Rather, notwithstanding the potential presence of hot spots in heroin, there is a sufficient basis supporting Dr. Nelson's differential diagnosis and expert opinion such that it will be helpful to the jury. The Court therefore will not exclude Dr. Nelson's opinion on the ground that his differential diagnosis was flawed and will instead leave any determination as to the relative strength of that opinion and its foundation to the jury.

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91 *United States v. Velasquez*, 64 F.3d 844, 849-50 (3d Cir. 1995) (internal quotation marks omitted).

92 *First Union Nat. Bank v. Benham*, 423 F.3d 855, 862 (8th Cir. 2005).

93 *Id.*

2. *But-for Causation*

Next, Defendants assert that Dr. Nelson's opinion does not have a valid scientific connection to the relevant inquiry, as he does not explain whether a heroin/carfentanil mixture was the but-for cause of the victims' overdoses and serious bodily injury.[94] The Supreme Court has held that, to sustain a conviction under 21 U.S.C. § 841, the Government must prove "that the harm would not have occurred in the absence of—that is, but for—the defendant's conduct."[95] Thus, even where multiple factors contribute to a harm, "if the predicate act combines with other factors to produce the result [liability still follows], so long as the other factors alone would not have done so—if, so to speak, it was the straw that broke the camel's back."[96]

Although Dr. Nelson did not explicitly testify that carfentanil was the but-for cause of the overdoses, his testimony makes clear that he believes carfentanil was indeed the but-for cause of the overdoses and resulting serious bodily injury. Dr. Nelson testified repeatedly—and it is not disputed—that the individuals overdosed on an opioid. As detailed previously, there is also a sound basis for Dr. Nelson's opinion that the individuals overdosed specifically on carfentanil. Dr. Nelson testified that carfentanil was "the 800-pound gorilla" and that when "you [take] a

94 Doc. 234 at 8-9; Doc. 236-2 at 8-10; Doc. 264 at 4-5; Doc. 265 at 7-8.

95 *Burrage v. United States*, 571 U.S. 204, 211 (2014).

96 *Id.*

massive dose of an opioid" you are likely to die, regardless of any other factors at play[97] and, consequently, carfentanil would be "the straw that broke the camel's back."[98] But-for causation is best exemplified by Dr. Nelson's testimony that "the basis of [my] decision is that was it not for the [carfentanil] overdose, the victims or the people, the patients, wouldn't have died, if we're talking about those two cases, or others wouldn't have overdosed."[99] Dr. Nelson's testimony thus makes clear that, in his expert medical opinion, the individuals would not have overdosed and "harm would not have occurred in the absence of" their ingestion of carfentanil.[100] His opinion thus sufficiently satisfies the *Burrage* standard, and will not be excluded on that ground.

### C. Fit

Finally, Defendants contend that some of Dr. Nelson's expert opinion is not relevant to this matter.[101] Specifically, Crowder argues that Dr. Nelson's opinion with regard to the overdose deaths of Delaney Farrell and Richard Harris is not relevant, as nothing connects their deaths to Defendants, and because there is no

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97 Doc. 259 at 142.

98 *Burrage*, 571 U.S. at 211.

99 Doc. 259 at 72. *See id.* at 151 (noting that facts surrounding the overdose demonstrate that overdose was caused by an "ultra-potent opioid").

100 *Burrage*, 571 U.S. at 211.

101 Doc. 234 at 5-7; Doc. 264 at 2-4.

dispute that opioid lethality and treatment are consistent regardless of the type of opioid.[102]

As noted previously, the fit prong "depends . . . upon the proffered connection between the scientific research or test result . . . and [the] particular disputed factual issues in the case."[103] Therefore, "[a] court must examine the expert's conclusions in order to determine whether they could reliably flow from the facts known to the expert and the methodology used," and "[a] court may conclude that there is simply too great a gap between the data and the opinion proffered."[104] "In other words, the expert's testimony must be relevant for the purposes of the case and must assist the trier of fact."[105]

The Court concludes that Dr. Nelson's opinion regarding the deaths of Delaney Farrell and Richard Harris is relevant to the case and would assist the jury, and his opinion will therefore be conditionally admitted.[106] First, contrary to Crowder's assertion, the Government contends that it has substantial evidence, including phone records, that demonstrates Howard sold a heroin/carfentanil mixture to Harris, and that Harris subsequently used, overdosed, and died due to that

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[102] *Id.*

[103] *Oddi*, 234 F.3d at 145 (internal quotation marks omitted).

[104] *Id.* at 146 (internal quotation marks omitted).

[105] *Schneider ex rel. Estate of Schneider v. Fried*, 320 F.3d 396, 404 (3d Cir. 2003).

[106] Notably, this determination is based at least partly upon a proffer from the Government asserting that it will present evidence linking Farrell's death to Crowder and Harris' death to Howard. (Doc. 247 at 40-42).

substance.[107] Similarly, the Government will produce evidence that Crowder sold a heroin/carfentanil mixture to Harris on June 30, 2017—a mixture that was identical to that which caused BB and KL to overdose—and that Harris overdosed and died on that substance.[108]

Second, tests were conducted on the decedents' blood, and those tests revealed the presence of carfentanil and/or fentanyl in their systems.[109] Tests were conducted on narcotics packets found on or near the decedents that revealed the presence of a heroin/carfentanil mixture.[110] As discussed previously, evidence similarly links this heroin/carfentanil mixture to the other non-lethal overdoses alleged in the indictment. Thus, evidence appears to directly link the two overdose deaths to the same heroin/carfentanil mixture that is at issue in the third superseding indictment.

This direct connection means that expert testimony related to the two overdose deaths is "relevant for the purposes of the case and [will] assist the trier of fact."[111] In that regard, such testimony is important in aiding jurors with respect to two decisions that they will need to make at trial: (1) whether the overdose victims used a heroin/carfentanil mixture, and (2) whether the overdose victims—if they did

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[107] *Id.* at 40-41.

[108] *Id.* at 41.

[109] Doc. 234-1 at 2; Gov. *Daubert* Ex. 7 at 8-9.

[110] *Id.*

[111] *Schneider*, 320 F.3d at 404.

ingest a heroin/carfentanil mixture—suffered serious bodily injury as a result of the overdose; that is, whether they were at risk of death.

As to the first point, Dr. Nelson testified that "there is a big public health component . . . in terms of how we respond medically to things and how we message to the public the availability of [an] ultra-potent supply" of heroin that is laced with carfentanil.[112] Knowledge that heroin is laced with an ultra-potent opioid such as carfentanil alters the differential diagnosis because "it definitely raises the likelihood of [an opioid overdose] diagnosis on a differential diagnosis list."[113] Dr. Nelson explained that "when you prioritize things, some of that has to do with—the statistical term would be pretest probability. In other words, what's the likelihood that this is going to happen."[114] Thus, knowing that some individuals have died from a heroin/carfentanil mixture increases the likelihood that others who are exhibiting overdose symptoms used the same potent heroin/carfentanil mixture as the decedents.[115]

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[112] Doc. 259 at 63.

[113] *Id.* at 65. *See also id.* at 90-91.

[114] *Id.* at 64.

[115] *See id.* at 151 (Dr. Nelson testifying with respect to one overdose victim "[w]ell, this is the same thing we deal with in all of these cases. He came in opioid intoxicated. He said he used an opioid. He said he used less than normal. And he overdosed. So the—again, the medical certainty aspect of that is he used what was currently available on the street at the time, which was the ultra-potent opioid, which was again the public health aspect of this that we talked about is carfentanil, unless you can tell me that there is another reason that this would have happened.").

With regard to the second point, knowledge of overdose deaths from a heroin/carfentanil mixture increases the likelihood that other overdose victims are at a risk of death absent effective and timely treatment. Thus, in circumstances where doctors know "that there is a . . . drug that is poisoning many and killing several[, such knowledge] would change the . . . aggressiveness at which we approach treating our patients who come in with opioid overdoses. We might have [a] lower threshold for giving naloxone or for intubating them because we recognize that it's a more dangerous product than we are used to seeing."[116] This speaks directly to the relative danger presented by the heroin/carfentanil mixture; the fact that the mixture may cause death without timely treatment indicates that those who overdosed on that mixture were at a substantial risk of death. Accordingly, the Court concludes that Dr. Nelson's opinion as to the overdose deaths may assist the jury in determining whether the overdose victims who did not die nevertheless suffered serious bodily injury.[117]

[116] *Id.* at 90-91.

[117] The Court notes that Crowder has raised issues with regard to the admissibility of any testimony related to the overdose deaths under Fed. R. Civ. P. 402 and 403. (*See* Doc. 234 at 6 n.2). The parties have not focused on this issue or developed arguments with respect to admissibility under those Rules. The Court will therefore not rule on the admissibility of such testimony under Rules 402 and 403 at this time. The parties may, if they choose, raise this issue at a later date in a motion *in limine*.

## III. CONCLUSION

For the foregoing reasons, the Court concludes that Dr. Nelson's expert testimony is admissible. Accordingly, Defendants' motions to exclude will be denied.

An appropriate Order follows.

BY THE COURT:

*s/ Matthew W. Brann*
Matthew W. Brann
United States District Judge